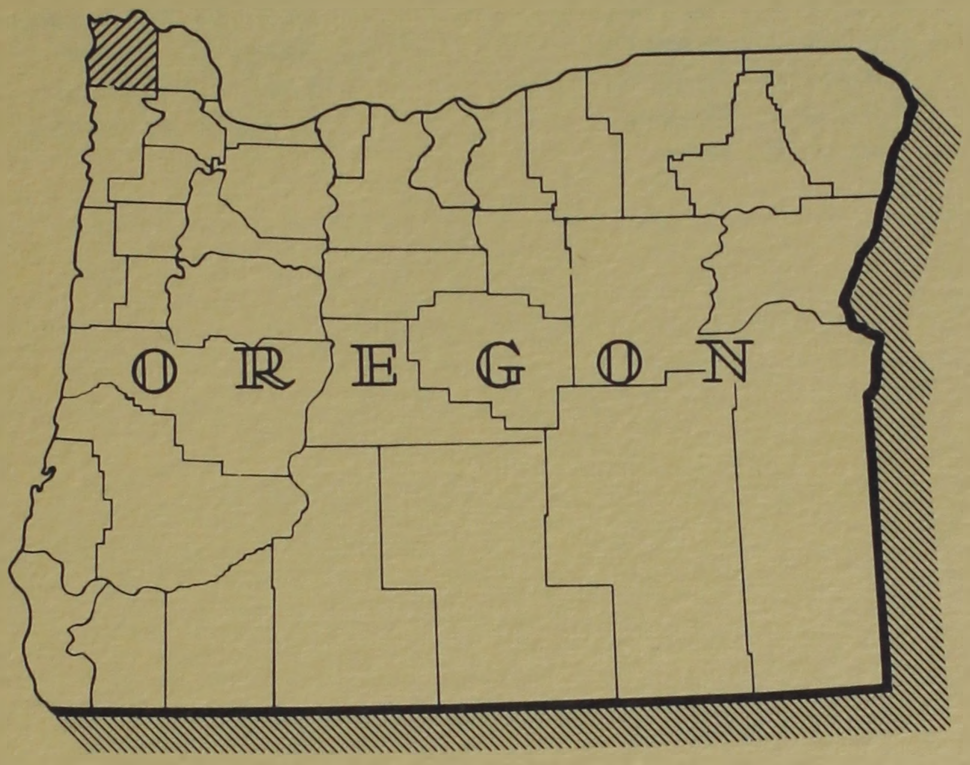
FOREST STATISTICS FOR CLATSOP COUNTY, OREGON

FOREST SURVEY REPORT NO. 113



U. S. DEPARTMENT OF AGRICULTURE · FOREST SERVICE
PACIFIC NORTHWEST FOREST AND RANGE EXPERIMENT STATION
R. W. COWLIN, DIRECTOR

PORTLAND, OREGON APRIL 1954

PREPARED BY THE DIVISION OF FOREST ECONOMICS

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1/ Acknowledgment is made of cooperation from several private and public agencies. The Oregon State Board of Forestry conducted the inventory of the State-owned lands in the county.

FOREST STATISTICS

FOR

CLATSOP COUNTY, OREGON

Forest Survey Report No. 113

by

F. L. Moravets

U. S. Department of Agriculture Forest Service
Pacific Northwest Forest and Range Experiment Station

R. W. Cowlin, Director
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FOREWORD

This publication summarizes in statistical form the results of a reinventory of the forests of Clatsop County, Oregon, conducted in 1952. This reinventory is a part of the maintenance phase of the Forest Survey, a Nationwide project of the Forest Service authorized by the McSweeney-McNary Forest Research Act of 1928 and amended June 25, 1949. The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them, to ascertain rates of forest growth and depletion, to estimate present consumption of timber products and to analyze and make available in reports survey information needed in the formulation of forest policies and programs.

The Forest Survey is conducted in the various forest regions of the Nation by the regional forest experiment stations of the Forest Service. In the Pacific Northwest region of Oregon and Washington it is an activity of the Pacific Northwest Forest and Range Experiment Station at Portland, Oregon.

Under the initial phase of the Forest Survey the forests of Clatsop County were inventoried in 1930. Later this inventory was adjusted to September 1933 and a statistical report "Forest Statistics for Clatsop County, Oregon" and a detailed forest type map--scale 1 inch to the mile--were released. In 1937 the first reinventory of the county's forests was made and a revised statistical report and forest type map prepared.

Following the second reinventory in 1952 the forest type map has been revised again and is available in a scale of either 1 or 2 inches to the mile. 1/

1/ A print of the forest type map is available at cost of blueprinting. For information write Director, Pacific Northwest Forest and Range Experiment Station, 423 U. S. Court House, Portland 5, Oregon.

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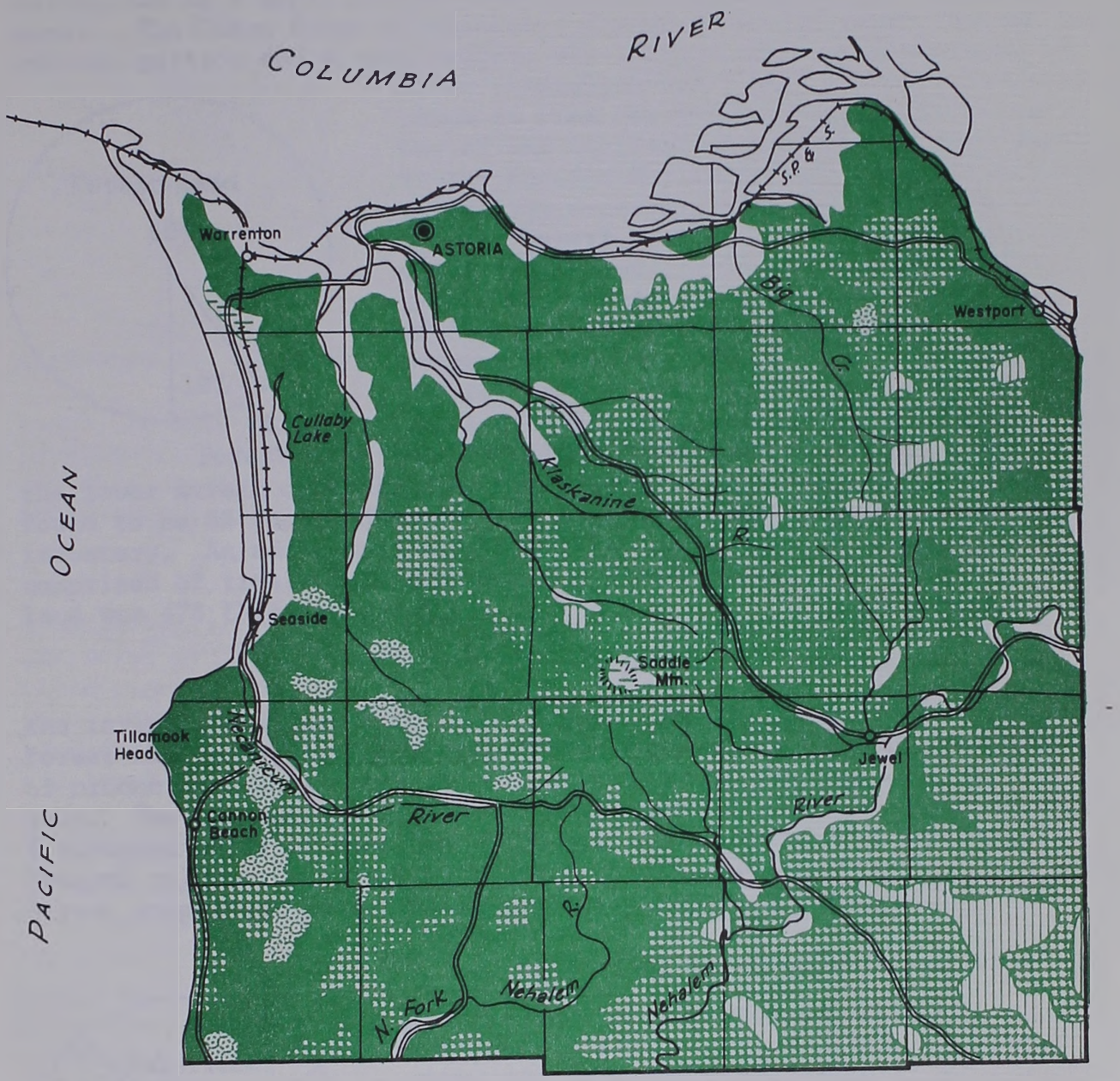
FOREST STAND-SIZE AND CONDITION CLASSES
CLATSOP COUNTY, OREGON
1952



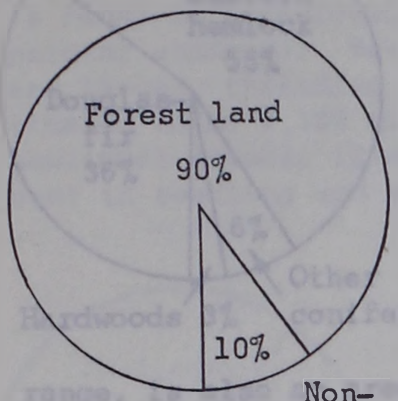
LEGEND

- Saw-timber stands
- Pole-timber, seedling and sapling stands
- Recent clear-cut areas, nonstocked
- Old nonstocked cutovers and burns
- Noncommercial area
- Nonforest land

SIGNIFICANT FINDINGS IN THE FOREST INVENTORY

LAND USE

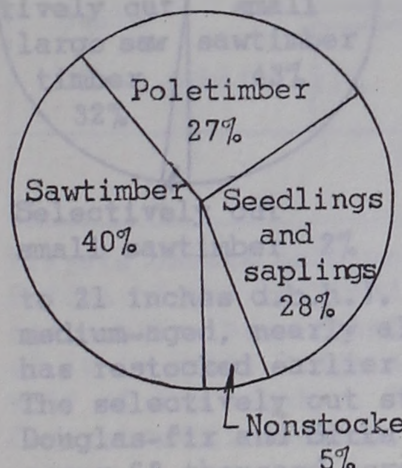
Situated in the extreme northwest portion of Oregon, Clatsop County borders on the Pacific Ocean on the west and on the Columbia River on the north. It is a small county with a total land area of 525 thousand acres. The Coast Range of mountains trends north and south through the central portion and a very broken, but fairly low-lying topography is found throughout the county. The altitudinal range is from sea level to about 3,200 feet. One of the earliest sites of white settlement in the Pacific Northwest, the county's history dates from discovery of the Columbia River by Captain Robert Gray in 1792 and first permanent white settlement in 1811. In these early years all of the county was forested except for limited stretches of sand dunes and tidal flats along the coastal plains and the river deltas. Land clearing for agriculture which progressed slowly until the latter third of the nineteenth century, has been confined very largely to narrow strips along the lower stream courses. The total area in agricultural use in 1952 was found to be 32 thousand acres, the same total that was found in the 1930 inventory. An additional area of 21 thousand acres of nonforest land was comprised of tidelands, sand dunes, and town sites. Total area of forest land was 473 thousand acres.



FOREST LAND

The inventory classed a total of 466 thousand acres, 98.5 percent of the forest land area, as commercial forest land, i.e., physically capable of producing usable crops of wood and not withdrawn from timber utilization. The 1.5 percent classed as noncommercial forest land consists of 4 thousand acres of reserved commercial forest land in State parks and Federal military reservations, and 3 thousand acres of rocky and sterile sites, supporting poor-quality timber, classed as noncommercial areas.

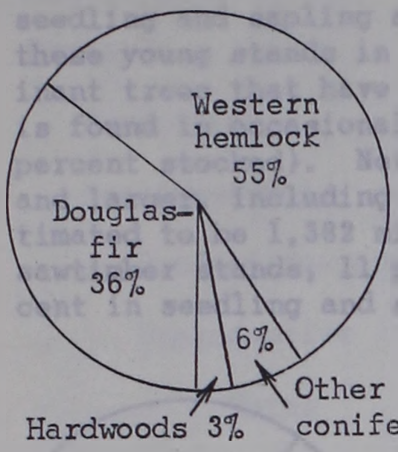
Stand-Size and Condition Classes



Classification of the unreserved commercial forest land by stand-size or condition classes shows 184 thousand acres occupied by sawtimber stands (trees 11" d.b.h. and larger). Stands of poletimber (trees 5" - 11" d.b.h.) are found on 123 thousand acres and stands of seedling and sapling size (trees 0" - 5" d.b.h.) covers 133 thousand acres. Total area of nonstocked forest land (less than 10 percent stocked), 26 thousand acres, is comprised of 11 thousand of recent clearcut land (cut since 1940), 12 thousand of earlier clearcut land (cut prior to 1940) and 3 thousand of deforested burn.

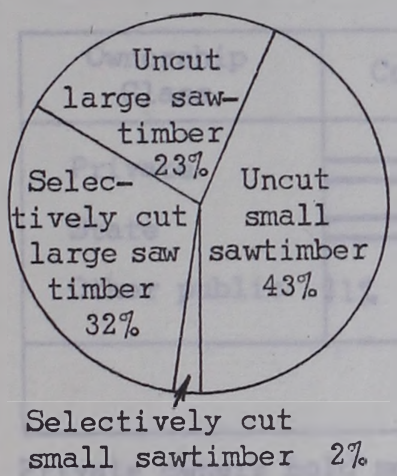
Commercial Forest Land by Type

The Coast Range that gives the county a broken, mountainous terrain also roughly divides it into two broad forest types. The western three-fifths of the county, comprised of the western slopes of the range leading to the Pacific Ocean, is a coastal fog belt of mild, equable climate, abundant rainfall, and frequent fogs. Here are ideal conditions for the western hemlock-Sitka spruce type. Hemlock predominates over a large part of this portion of the county; it occurs both in pure stands and in mixtures in which spruce is the principal associate and Douglas-fir a minor associate. Spruce predominates over a much smaller acreage; it was the key species in more of the original stands than in the present stands. Red alder, chiefly in pure stands, covers the bottomlands and lower slopes along stream courses. This hardwood is also frequently in the understory of the conifer types. The eastern two-fifths of the county, consisting of the eastern slopes of the range, is also an area highly favorable for forest growth and especially Douglas-fir. This species comprises the type over a very large part of the area, occurring both in pure and mixed stands. Hemlock and red alder are frequent associates and western redcedar is occasionally present.



Character of Sawtimber Stands

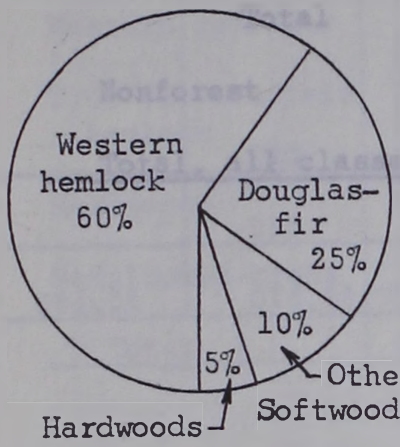
Logging activity during more than a century very materially altered the character of the sawtimber stands in the county. Early bull-team operations removed the large, old-growth timber adjacent to the Columbia River; later, heavy power logging with steam donkey and railroad moved across the eastern half of the county; and lastly, in the past two decades tractor and truck operations have covered a large area in the western portion. Log production reached a peak during the 1920's when the county led the State in log volume. It dropped off in the early 1930's but again rose to its previous high late in the decade. Since 1940 annual cut has gradually decreased to less than half the peak rate. In spite of this large-scale cutting, present sawtimber stands cover two-fifths of the commercial forest area. These stands are of two types: uncut (stands essentially undisturbed by cutting), and selectively cut (stands in which a partial harvest has been made). The uncut sawtimber covers 122 thousand acres; on 42 thousand they may be classed as large (more than 21 inches d.b.h.) and on 80 thousand as small (11 to 21 inches d.b.h.). The large uncut sawtimber is chiefly young- to medium-aged, nearly all under 250 years; the small uncut sawtimber which has restocked earlier clearcut areas is all young, from 40 to 80 years. The selectively cut stands, resulting from the removal of large old-growth Douglas-fir and Sitka spruce from stands with an understory of hemlock, cover 62 thousand acres.



TIMBER VOLUME

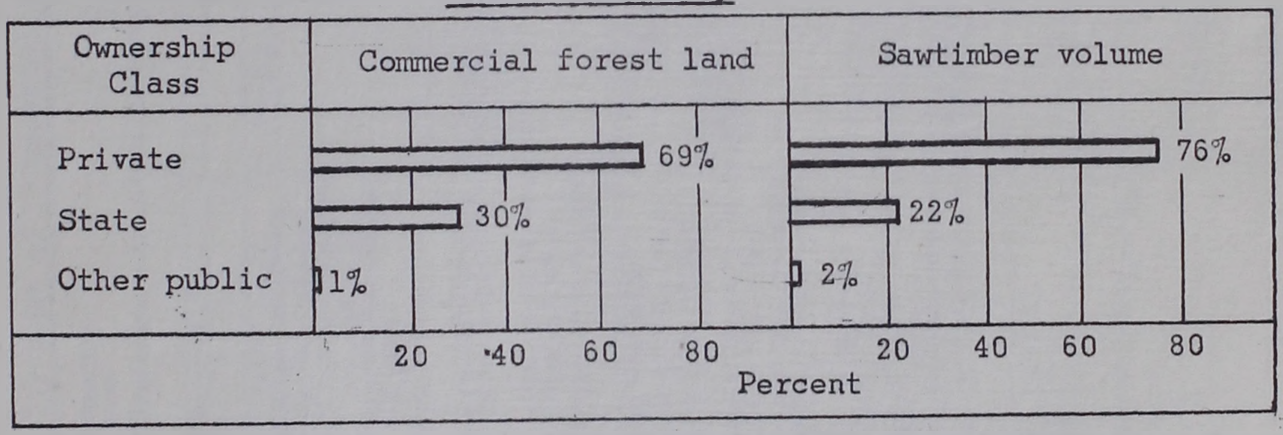
Estimated net volume of live sawtimber trees (11 inches d.b.h. and larger) on unreserved commercial forest land totals 6,561 million board feet, log scale, Scribner rule. Of this volume 6,263 million, 95 percent, is in sawtimber stands. The volume in poletimber stands is 231 million and in seedling and sapling stands 60 million; such volume is in the overstory of these young stands in either scattered old-growth trees or occasional dominant trees that have reached sawtimber size. A volume of 7 million feet is found in occasional trees on areas classed as nonstocked (less than 10 percent stocked). Net volume of growing stock (live trees 5 inches d.b.h. and larger, including trees of both poletimber and sawtimber size) is estimated to be 1,382 million cubic feet; 87 percent of this volume is in sawtimber stands, 11 percent in poletimber stands, and the remaining 2 percent in seedling and sapling stands or on nonstocked areas.

Volume of Sawtimber by Species



Total volume of sawtimber in softwood species is 6,215 million board feet; the total of hardwood species is 346 million. Volume of western hemlock, 3,904 million, is fairly evenly distributed as to broad diameter class of timber: 27 percent in trees 11" - 21" d.b.h., 29 percent in 21" - 31" class, 30 percent in 31" - 41" class, and 14 percent in 41" plus class. Division of the 1,639 million of Douglas-fir is: 54 percent in 11" - 21" class, 35 percent in 21" - 31" class, 3 percent in 31" - 41" class, and 8 percent in 41" plus class. "Other softwoods" includes Sitka spruce, western redcedar, Pacific silver fir, and grand fir. Red alder comprises 93 percent of the hardwood volume and bigleaf maple the remainder.

Forest Ownership



Private owners hold more than three-fourths of the sawtimber area, three-fifths of the combined acreage of poletimber and seedlings and saplings, and nearly three-fourths of the nonstocked area. State ownership, much of it in quite large solid blocks, is located principally in the eastern half of the county. "Other public" includes small areas each of county, Federal public domain, and municipal ownerships.

Table 1.--Land area, by major classes of land, 1952

Class of land	Area
	Acres
Forest:	
Commercial	465,600
Noncommercial:	
Productive-reserved	3,910
Unproductive	3,040
Total	472,550
Nonforest	52,930
Total, all classes	525,480

Table 2.--Area of commercial forest land by ownership and stand-size class, 1952

Ownership class	Total	Saw-timber stands	Pole-timber stands	Seedling and sapling stands	Nonstocked areas
	Acres	Acres	Acres	Acres	Acres
Private	318,320	142,020	74,800	83,390	18,110
State	141,140	39,100	47,270	47,860	6,910
County	3,050	830	870	790	560
Municipal	760	570	180	10	
Federally owned or managed:					
Bureau of Land Mgt.	2,330	1,530	280	520	
Total Federal	2,330	1,530	280	520	
All ownerships	465,600	184,050	123,400	132,570	25,580

Table 3.--Area of commercial forest land by major forest type and stand-size class, 1952

Forest type	Total	Sawtimber stands		Pole-timber stands	Seedling and sapling stands	Non-stocked areas
		Old growth	Young growth			
	Acres	Acres	Acres	Acres	Acres	Acres
Douglas-fir	161,460	1,200	33,480	67,970	58,810	
Western hemlock	240,700	84,210	46,700	41,440	68,350	
Sitka spruce	21,350	7,410	2,360	7,270	4,310	
Western redcedar	1,520	1,360		40	120	
True fir-mountain hemlock	2,350	2,270		80		
Hardwoods	12,640		5,060	6,600	980	
Nonstocked areas	25,580					25,580
Total	465,600	96,450	87,600	123,400	132,570	25,580

Table 4.--Area of commercial and noncommercial forest land and nonforest land by cover type and ownership class, 1952

(Acres)

Survey type symbol	Cover type	Total	Unreserved						Reserved		
			Total	Private	State	County	Municipal	Federal public domain	Total	State	Military reservation
	ALL LANDS										
	Forest land	472,550	468,000	319,930	141,310	3,420	770	2,570	4,550	4,060	490
	Nonforest land	52,930	51,220	46,900	820	3,260	240		1,710	1,160	550
	Total	525,480	519,220	366,830	142,130	6,680	1,010	2,570	6,260	5,220	1,040
	COMMERCIAL FOREST LAND										
D5	Douglas-fir large old-growth saw timber (yellow fir)	1,360	1,200	1,000	40			160	160	160	
D4	Douglas-fir small old-growth and large young-growth saw timber (red fir)	4,360	4,360	1,880	2,480						
D3	Douglas-fir small young-growth saw timber	29,220	29,120	14,040	14,640	40		400	100	100	
D2	Douglas-fir pole timber	68,110	67,970	30,940	36,620	190	20	200	140	140	
D1	Douglas-fir seedlings and saplings	59,550	58,810	27,780	30,030	680		320	740	740	
H4	Western hemlock large saw timber	84,450	84,210	72,550	10,730	400	210	320	240	200	40
H3	Western hemlock small saw timber	46,930	46,700	37,020	9,170	120	100	290	230	180	50
H2	Western hemlock pole timber	41,970	41,440	31,690	9,240	270	160	80	530	480	50
H1	Western hemlock seedlings and saplings	68,800	68,350	50,490	17,630	20	10	200	450	370	80
S4	Sitka spruce large saw timber	8,080	7,410	6,190	810	30	220	160	670	580	90
S3	Sitka spruce small saw timber	2,680	2,360	1,920	200	200	40		320	240	80
S2	Sitka spruce pole timber	7,350	7,270	6,870	80	320			80	80	
S1	Sitka spruce seedlings and saplings	4,350	4,310	4,200	40	70			40	40	
C4	Western redcedar large saw timber	1,360	1,360	1,200	160						
C2	Western redcedar pole timber	40	40	40							
C1	Western redcedar seedlings and saplings	120	120	120							
FM4	True fir-mountain hemlock large saw timber	2,270	2,270	1,910	200	40		120			
FM2	True fir-mountain hemlock pole timber	80	80	80							
HD3	Hardwood small saw timber	5,100	5,060	4,310	670			80	40	40	
HD2	Hardwood pole timber	6,770	6,600	5,180	1,330	90			170	70	100
HD1	Hardwood seedlings and saplings	980	980	800	160	20					
X	Recent clear-cut area nonstocked	11,150	11,150	10,500	650						
XO	Old clear-cut area nonstocked	11,820	11,820	5,650	5,610	560					
F	Deforested by fire nonstocked	2,610	2,610	1,960	650						
	Total	469,510	465,600	318,320	141,140	3,050	760	2,330	3,910	3,420	490
	NONCOMMERCIAL FOREST LAND										
NR	Noncommercial rocky	3,040	2,400	1,610	170	370	10	240	640	640	
	NONFOREST LAND										
A	Agriculture	31,660	31,600	31,270	290	40			60	60	
G	Grass and brush	11,810	11,040	7,930	320	2,760	30		770	690	80
O	Open--nonvegetative	9,460	8,580	7,700	210	460	210		880	410	470
	Total	52,930	51,220	46,900	820	3,260	240		1,710	1,160	550

Table 5.--Area of commercial forest land by generalized forest type and ownership class, 1952

(Acres)

Generalized forest type	Total	Unreserved						Reserved		
		Total	Private	State	County	Municipal	Federal public domain	Total	State	Military reservation
Conifer sawtimber										
Types D3, D4, D5, H3, H4, S3, S4, C4, and FM4										
Uncut	119,100	117,420	86,870	27,890	790	500	1,370	1,680	1,420	260
Selectively cut	61,610	61,570	50,840	10,540	40	70	80	40	40	
Total	180,710	178,990	137,710	38,430	830	570	1,450	1,720	1,460	260
Conifer pole timber										
Types D2, H2, S2, C2, FM2										
On cutovers	105,630	104,980	61,820	42,120	780	180	80	650	600	50
On burns	6,120	6,020	2,500	3,320			200	100	100	
On plantations	5,800	5,800	5,300	500						
Total	117,550	116,800	69,620	45,940	780	180	280	750	700	50
Conifer seedlings & saplings										
Types D1, H1, S1, C1										
On cutovers	91,800	91,260	59,220	31,180	730	10	120	540	460	80
On burns	26,850	26,480	18,040	8,120			320	370	370	
On plantations	14,170	13,850	5,330	8,400	40		80	320	320	
Total	132,820	131,590	82,590	47,700	770	10	520	1,230	1,150	80
Recent clearcut areas, Nonstocked: Type X	11,150	11,150	10,500	650						
Nonstocked clearcut or burned-over areas: Types XO and F	14,430	14,430	7,610	6,260	560					
Hardwoods: Types HD1, HD2, HD3	12,850	12,640	10,290	2,160	110		80	210	110	100
Total	469,510	465,600	318,320	141,140	3,050	760	2,330	3,910	3,420	490

Table 6.--Net volume of live sawtimber[1/] and growing stock[2/] on commercial forest land by ownership class, 1952

Ownership class	Sawtimber		Growing stock
	Million board feet, log scale, Scribner rule	Million board feet, International ¼-inch rule	Million cubic feet
Private	5,015	5,474	1,037
State	1,443	1,575	323
County	30	33	7
Municipal	20	22	4
Federally owned or managed:			
Bureau of Land Management	53	58	11
Total Federal	53	58	11
All ownerships	6,561	7,162	1,382

1/ Includes live trees 11.0 inches diameter breast height and larger measured in board feet.

2/ Includes live trees 5.0 inches diameter breast height and larger measured in cubic feet.

Table 7.--Net volume of live sawtimber and growing stock on commercial forest land by stand-size class, 1952

Stand-size class	Sawtimber		Growing stock
	Million board feet, log scale, Scribner rule	Million board feet, International ¼-inch rule	Million cubic feet
Sawtimber stands	6,263	6,832	1,205
Poletimber stands	231	256	156
Seedling and sapling stands	60	66	19
Nonstocked areas	7	8	2
Total	6,561	7,162	1,382

Table 8.--Net volume of live sawtimber and growing stock on commercial forest land, by species, 1952

Species	Sawtimber		Growing stock
	Million board feet, log scale, Scribner rule	Million board feet, International ¼-inch rule	Million cubic feet
Softwoods:			
Douglas-fir	1,639	1,834	355
Western hemlock	3,904	4,217	792
Sitka spruce	380	402	76
Western redcedar	198	210	31
Pacific silver fir	92	99	27
Grand fir	2	2	
Total	6,215	6,764	1,281
Hardwoods:			
Red alder	323	372	95
Bigleaf maple	23	26	6
Total	346	398	101
All species	6,561	7,162	1,382

Table 9.--Net volume of Douglas-fir, western hemlock, and Sitka spruce live sawtimber on commercial forest land by diameter-class group and log rule, 1952

Diameter class and log rule	Total	Douglas-fir	Western hemlock	Sitka spruce
	-- Million board feet --			
11.0" to 20.9" d.b.h.				
Scribner rule	1,990	875	1,054	61
International ¼-inch rule	2,218	1,015	1,139	64
21.0" to 30.9" d.b.h.				
Scribner rule	1,810	575	1,132	103
International ¼-inch rule	1,953	621	1,223	109
31.0" to 40.9" d.b.h.				
Scribner rule	1,296	57	1,171	68
International ¼-inch rule	1,397	60	1,265	72
41.0" d.b.h. and larger				
Scribner rule	827	132	547	148
International ¼-inch rule	885	138	590	157
All diameter classes				
Scribner rule	5,923	1,639	3,904	380
International ¼-inch rule	6,453	1,834	4,217	402

Table 10.--Net volume of all timber on commercial forest land by class of material and species group, 1952

Class of material	Total	Softwoods	Hardwoods
	Million cubic feet	Million cubic feet	Million cubic feet
Growing stock:			
Sawtimber trees:			
Sawlog portion	1,097	1,017	80
Upper-stem portion	83	77	6
Total	1,180	1,094	86
Poletimber trees	202	187	15
Total growing stock	1,382	1,281	101
Other material:			
Sound cull trees	2	2	
Rotten cull trees	14	14	
Salvable dead trees	12	12	
Total other material	28	28	
Total, all timber	1,410	1,309	101

Table 11.--Average annual timber cut from live sawtimber and growing stock on commercial forest land, by species group, for the period 1948-1952 incl.

Species group	Live sawtimber						Growing stock		
	Timber products	Logging residues	Timber cut 1/	Timber products	Logging residues	Timber cut 1/	Timber products	Logging residues	Timber cut 1/
	Thousand board feet, log scale, Scribner rule			Thousand board feet, International ¼-inch rule			Thousand cubic feet		
Softwoods	124,976	12,198	137,174	135,991	13,273	149,264	22,631	2,279	24,910
Hardwoods	6,994	683	7,677	8,067	788	8,855	1,808	182	1,990
Total	131,970	12,881	144,851	144,058	14,061	158,119	24,439	2,461	26,900

1/ Total of timber products and logging residues. Timber products is the portion of the inventory volume removed from the forest; logging residues is the portion cut or killed in logging not removed from the forest.

FOREST SURVEY PROCEDURE

The procedures used in the second Forest Survey reinventory of Clatsop County were materially different from the procedures used in the initial inventory and first reinventory. This change in procedures accounts for some significant differences in both the forest-area and timber-volume statistics obtained. Therefore, a brief description of each of the procedures seems desirable.

Initial Inventory

The initial inventory of the county was conducted in 1930 by what was known as the "compilation method." In this method existing information on forest types, timber cruises, and other pertinent data were collected from private timber owners and various public agencies. These data were checked in the field for reliability, and were then adjusted to the specifications and standards of Forest Survey. Forest-type and timber-volume data for areas not covered by existing information were obtained through intensive field reconnaissance.

All land in the county was classified as either forest or nonforest. Forest land was further classified as commercial or noncommercial; the commercial forest land was still further classified by type, stand-size class and, in case of young-growth stands, by stocking and age classes. These types and classes were delineated on 1-inch-to-the-mile base maps of each township. These township type maps were then superimposed over ownership-status plats and dot-counted to obtain forest-type-area statistics by ownership class. Type delineations on the township maps were traced on a base map of the county to form a county forest type map.

First Reinventory

The first reinventory, in 1937, included a complete revision of the forest type map of the county. For this revision, records of cutting and other forms of drain, since the original inventory, were obtained from various sources and verified in the field by ground reconnaissance. Areas on which the type had changed due to cutting, restocking of cutover or burned-over land, and ingrowth of immature stands were remapped on the ground. The ownership status was brought up to date. On the basis of the new ownership data and the revised forest type map, area statistics by forest types were recomputed.

Timber volume estimates for virgin sawtimber stands were based on cruise data collected during the original survey, adjusted for cutting and other drain. Volume estimates for immature stands were determined from yield tables adjusted for site, quality, age and density of stands.

Second Reinventory

In the second reinventory, in 1952, complete revision of the forest type map was obtained through interpretation, classification, and mapping on aerial photos covering all of the land area. In the mapping on aerial photos, types whose classifications were in doubt and species composition of stands were checked in the field. The use of aerial photos in mapping resulted in type delineations of much greater accuracy and detail than were possible through the ground reconnaissance employed in the initial inventory and first reinventory. In the preparation of a revised type map, the delineations on the aerial photos were transferred to a 2-inch county base map through use of a photo projector. The new type map was then superimposed over a current ownership-status map of complete county coverage and a dot count made of forest type areas by ownership class.

Volume estimates each of live sawtimber, growing stock, and salvable dead material were calculated by applying average per-acre volumes to the appropriate forest type acreages. The average per-acre volumes for sawtimber stands and poletimber stands were obtained through a sampling procedure in which the stands were measured on randomly selected plots. Intensity of the sampling was so designed as to produce a total estimate of volume in the county of a specified sampling accuracy set by Forest Survey. In the random selection of samples each individual sawtimber or poletimber stand in the county had an equal chance of being selected. A sample consisted of a cluster of 3 one-fifth-acre circular plots spaced at regular 6-chain intervals. A total of 191 plot clusters, or 573 one-fifth-acre plots was taken in sawtimber and poletimber stands.

Average per-acre volumes for seedling and sapling stands and nonstocked areas were obtained through an aerial photo plot sampling procedure. A large number of one-acre photo plots was taken in a modified systematic-random pattern. By photo interpretation, estimates were made of average number of trees per acre of both sawtimber and poletimber size, average crown diameter, and total tree height. Gross volume of the average tree was obtained from photo volume tables and then adjusted for defect and breakage in order to obtain net volume.

ACCURACY OF DATA

Forest Area

In the reinventory of the county, in-place mapping of the forests and their classification by forest type, stand-size class, or condition class were on the basis of 100-percent coverage. Thus no error because of sampling was involved. Errors due to techniques or judgment in the field and in office computation of data were possible, but

difficult to evaluate. Throughout all phases of the work close supervision and frequent checks assured a high level of accuracy and uniformity of standards.

Timber Volume

For the timber volume, derived from sampling surveys, the chances are two out of three that the estimated total sawtimber volume in the county does not vary in either direction from the true volume more than ± 4.00 percent; the estimated total growing-stock volume does not vary more than ± 3.26 percent.

COMPARISON OF INVENTORIES

Due to considerable differences in Forest Survey specifications, standards of utilization, and survey procedure, a direct comparison of many of the statistics resulting from the 1952 reinventory, as shown in tables 1 to 10, with those from the initial inventory in 1930 and first reinventory in 1937 is not possible. However, some of the statistics can be compared after adjustments have been made for differences in specifications and standards.

Forest Land

The forest land areas, classified by stand-size and condition classes, resulting from the three inventories, are shown in the table below. In this comparison the area of commercial forest land both in unreserved and reserved ownership status has been combined. The 1952 acreage by stand-size and condition class shown in tables 2 and 3 of this report is the area of only the unreserved commercial forest land.

Changes in Forest Land by Stand-Size and Condition Classes Between Inventories

Inventory	Total forest land	Commercial forest land (Unreserved and reserved)					Noncommercial forest land
		Total	Sawtimber	Poletimber	Seedlings and saplings	Nonstocked area	
	Thousands of acres						
1930	478	477	1/ 234	57	41	145	1
1937	478	477	1/ 219	37	81	140	1
1952	473	470	2/ 186	124	134	26	3

1/ Includes 24 thousand acres of selectively cut sawtimber.
2/ " 62 " " " " " " "

With the exception of the seedling and sapling stands and nonstocked areas, the acreages for a given class are on a comparable basis. The

sawtimber acreages, for instance, include stands 11.0 inches d.b.h. and larger; the poletimber acreages include stands 5.0 to 10.9 inches d.b.h. The seedling and sapling acreages for all three inventories include stands from 0 to 4.9 inches d.b.h., but those for 1930 and 1937 do not include stands on areas clearcut in the prior 10 years that were restocked at time of the inventory; such land was included in the nonstocked class. The 1952 acreage does include the area of seedling and sapling stands on recently clearcut land, cut in prior 10 years, if they were found to be established at time of the inventory. This difference in classification procedure has a corresponding effect on the acreages of nonstocked areas--the 1930 and 1937 acreages included all recently clearcut land, cut in prior 10 years, regardless of status of restocking at time of inventory; the 1952 acreage does not include the area of such land as had become restocked or had advanced growth in 1952.

The small decrease in area--6 thousand acres--of forest land between 1930 and 1952 is due to a difference between inventories in type classification and mapping; in 1952 a greater acreage was classed as either grassland or nonvegetative. During the period between inventories the area in agricultural use remained practically the same. Likewise, the decrease in area of commercial forest land--7 thousand acres--is due chiefly to a difference in type classification; some 2 thousand acres was put in a reserved status in State Parks.

The acreages in the tabular comparison above do not provide a very good picture of what has happened to the sawtimber stands between 1930 and 1952. In 1930 more than 80 percent of the sawtimber area was stocked with large sawtimber (more than 21 inches d.b.h.) a very large part of which could be classed as old growth; the remainder was occupied by small young-growth sawtimber (11 to 21 inches d.b.h.). In 1952 only a little more than one-half of the sawtimber acreage was classed as large and a very little could be classed as old growth. For example, the area of large, old-growth Douglas-fir type (more than 42 inches d.b.h.) decreased during the 22-year interval from 64 thousand to 1 thousand acres. There also has been a large increase in the proportion of the total acreage of sawtimber that is comprised of selectively cut stands (stands from which large, old-growth Sitka spruce and Douglas-fir were removed leaving a residual stand chiefly of western hemlock). In 1930 about one-tenth of the sawtimber acreage had been selectively cut; in 1952 the proportion was one-third.

Timber Volume

Direct comparison of the total sawtimber volume obtained in the 1952 inventory with the volumes obtained in the 1930 and 1937 inventories is not possible. One reason is that the minimum diameter specification for sawtimber which was 15 inches in the 1930 and 1937 inventories was lowered to 11 inches in 1952. A second reason is that during the 22-year interval there has been much intensification of

timber utilization on logging operations; in recent years more of the gross stand volume is being removed from the woods as timber products. In the 1952 inventory this intensification was accounted for by using volume tables that gave significantly greater volumes for a tree of a given size than did the tables used in the two earlier inventories. And another reason is the inclusion in 1952 of the volume in scattered trees of sawtimber size in the overstory of poletimber and seedling and sapling stands and including a small volume on cutover and burned-over lands classed as nonstocked.

A comparison of the board-foot volumes in sawtimber trees in sawtimber and poletimber stands only may be made after they are put on the same basis of specifications and standards. The 1930 unreserved and reserved volume adjusted to the 11-inch minimum diameter of sawtimber trees and in terms of the volume tables used in the 1952 inventory would have been 11,643 million board feet, log scale, Scribner rule; the corresponding volume in 1952 was 6,556 million, a decrease of 43.7 percent.

The cubic-foot volume of growing stock in sawtimber and poletimber stands obtained in the 1930 inventory is quite comparable to the volume obtained in 1952 as there were only slight differences in specifications and standards of utilization between inventories. The volume of all trees 5.0 inches d.b.h. and larger in sawtimber and poletimber stands, in both unreserved and reserved ownerships, was 2,313 million cubic feet in 1930 and in 1952 it was 1,373 million, a decrease of 40.6 percent.

DEFINITION OF TERMS USED

Land Area

Total Land

Includes dry land and unmeandered water surface.

Forest Land

Includes (a) land which is at least 10 percent stocked by trees of any size and capable of producing timber or other wood products, or of exerting an influence on the climate or on the water regime; and (b) land from which the trees described in "(a)" have been removed to less than 10-percent stocking and which has not been developed for other use. Minimum area of forest land recognized in reinventory of the county was 10 acres.

Nonforest Land

Land that does not qualify as forest land. Minimum area recognized in the reinventory of the county was 10 acres.

Forest Land Classes

Commercial Forest Land

Forest land which is producing, or is physically capable of producing, usable crops of wood, economically available now or prospectively, and not withdrawn from timber utilization.

Noncommercial Forest Land

Forest land (a) withdrawn from timber utilization through statute, ordinance, or administrative order but which otherwise qualifies as commercial forest land and (b) incapable of yielding usable wood products (usually sawtimber) because of adverse site conditions, or so physically inaccessible as to be unavailable economically in the foreseeable future.

Productive-reserved. Forest land withdrawn from timber utilization through statute, ordinance, or administrative order, but which otherwise qualifies as commercial forest land.

Unproductive. Forest land incapable of yielding usable wood products (usually sawtimber) because of adverse site conditions, or so physically inaccessible as to be unavailable economically in the foreseeable future.

Forest Types

Forest Type

A forest stand characterized by the predominance of certain key species--in terms of cubic volume for sawtimber and poletimber stands, and in number of trees for seedling and sapling stands--or a forest condition such as nonstocked cutover or burned-over land. The generalized forest types listed in table 3 are of the following composition:

Douglas-fir. Stands comprised of 50 percent or more of Douglas-fir by cubic volume or number of trees.

Western hemlock. Stands comprised of 50 percent or more of western hemlock by cubic volume or number of trees.

Sitka spruce. Stands comprised of 50 percent or more of Sitka spruce by cubic volume or number of trees.

Western redcedar. Stands comprised of 40 percent or more of western redcedar by cubic volume or number of trees.

True fir-mountain hemlock. Stands in which either Pacific silver fir, white fir, or mountain hemlock, or any combination of these species, comprise 50 percent or more of the cubic volume or number of trees.

Hardwoods. Stands comprised of 50 percent or more of one of the merchantable hardwood species.

Nonstocked areas. Cut-over or burned-over areas on which the restocking, if any, is less than 10 percent density and which does not support a residual stand meeting minimum sawtimber requirements.

Tree Classes

Sawtimber Tree

Softwood or hardwood tree 11.0 inches d.b.h. or larger containing at least one 16-foot log to a variable top diameter inside bark approximating 40 percent of diameter breast height, but never less than 8 inches, and in which 25 percent or more of the gross board-foot volume is free from rot and defect.

Poletimber Tree

Softwood or hardwood tree 5.0 to 10.9 inches d.b.h. in which 25 percent or more of the gross cubic-foot volume is free from rot and defect.

Cull Tree

Live tree of sawtimber or poletimber size that is unmerchantable, now or prospectively, because of defect or rot.

Sound cull tree. Live tree of sawtimber or poletimber size which contains 25 percent or more of sound volume but will not make at least one merchantable log, now or prospectively, because of roughness or poor form.

Rotten cull tree. Live tree of sawtimber or poletimber size in which less than 25 percent of the total volume is sound.

Salvable Dead Tree

Standing dead or down tree which contains 25 percent or more of sound volume and at least one merchantable log.

Stand-Size Classes

Sawtimber Stand

Stand of sawtimber trees having a minimum net volume per acre as follows: 5,000 board feet, log scale, Scribner rule, in any species except the pines and hardwoods; 1,500 board feet in the pines and hardwoods.

Old-growth sawtimber stand. Stand in which the majority of the cubic-foot volume is in trees more than about 180 years of age and larger than 21.0 inches d.b.h.

Large old-growth sawtimber stand. Stand in which the majority of the volume is in trees more than 41.0 inches d.b.h.

Young-growth sawtimber stand. Stand in which the majority of the cubic-foot volume is in trees under about 180 years of age and from 11.0 inches to 40.9 inches d.b.h.

Poletimber Stand

Stand failing to meet sawtimber-stand specifications but of at least 10 percent stocking of trees 5.0 inches d.b.h. and larger, with at least one-half the minimum stocking in poletimber trees (5.0 inches to 10.9 inches d.b.h.).

Seedling and Sapling Stand

Stand not qualifying as either sawtimber or poletimber stand but having at least 10-percent stocking of trees and with at least one-half the minimum stocking in seedlings and saplings (0-inch to 4.9 inches d.b.h.).

Uncut Sawtimber Stand

Stand that is essentially undisturbed by cutting.

Selectively Cut Sawtimber Stand

Stand in which a partial harvest has been made, and in which the residual volume amounts to 5 thousand board feet per acre or more.

Timber Volume

Live Sawtimber Volume

Net volume in board feet of live sawtimber trees:

Scribner rule. The common board-foot rule used in determining log-scale volume of sawtimber in this region. This rule underestimates, particularly in case of timber of the smaller diameters, the volume of lumber that could be produced from the timber.

International $\frac{1}{4}$-inch rule. The standard board-foot rule adopted by the Forest Service in the presentation of Forest Survey volume statistics.

Growing Stock

Net volume in cubic feet of live sawtimber trees and live poletimber trees from stump to a minimum 4.0-inch top (of central stem) inside bark.

Sawtimber Volume

Net volume in board feet of live and salvable dead sawtimber trees to a merchantable top.

All-Timber Volume

Net volume in cubic feet of live and salvable dead sawtimber trees and poletimber trees of commercial species, and cull trees of all species from stump to a minimum 4.0-inch top inside bark.

Commercial Tree Species

Tree species that are considered in determining stocking of stands and growing-stock volume. Includes species presently or prospectively usable for commercial timber products.

Commercial tree species in Clatsop County include:

Softwoods:

Douglas-fir (Pseudotsuga menziesii)
Western hemlock (Tsuga heterophylla)
Sitka spruce (Picea sitchensis)
Western redcedar (Thuja plicata)
Pacific silver fir (Abies amabilis)
Grand fir (Abies grandis)

Hardwoods:

Red alder (Alnus rubra)
Bigleaf maple (Acer macrophyllum)

Timber Cut

Timber Cut from Live Sawtimber

Board-foot volume of live sawtimber trees removed from commercial forest land during a specified year as timber products and that left as logging residue.

Timber products. Board-foot volume of live sawtimber entering into timber products during a specified year.

Logging residue. Board-foot volume of live sawtimber that is cut or killed in logging during a specified year but is not removed from the forest as timber products.

Timber Cut from Growing Stock

Cubic-foot volume of live sawtimber and poletimber trees removed from commercial forest land during a specified year as timber products and left as logging residue.

Timber products. Cubic-foot volume of growing stock entering into timber products during a specified year.

Logging residue. Cubic-foot volume of growing stock that is cut or killed in logging during a specified year but is not removed as timber products.